



Admission Test for B.Sc. Computer Science Honours-2006
St. Xavier's College
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FORMAT OF THE ADMISSION TEST

Total Time: 1hr 30 minutes

Total number of Questions=50

A. Reading Comprehension	Number of questions	:	10
B. Understanding Relationships	Number of questions	:	10
C. Logical Reasoning	Number of questions	:	10
D. Problem solving Mathematics	Number of questions	:	10
E. Problem solving Physics	Number of questions	:	10

INSTRUCTIONS:

1. Do not open this Test Booklet until you are asked to do so.
2. All questions are compulsory.
3. Use of calculator, log table, slide rule, mobile phones etc. are not allowed.
4. The Test Booklet contains 50 multiple choice questions and a separate Answer Sheet. Answer should be marked only on the Answer Sheet.
5. Use fountain pen or ball pen to write on the Answer Sheet.
6. Do not write anything on the Test Booklet.
7. You may do your rough work or calculations in the blank sheets provided at the end of the Test Booklet.
8. Each question carries equal marks. For each correct answer 2(two) marks are awarded. For an incorrect entry 1(one) mark will be deducted.
9. Do not leave the Examination Hall unless specifically instructed.
10. The Test Booklet should not be taken outside the Examination Hall under any circumstances during or after the Examination.
11. Submit the Test Booklet along with your Answer Sheet at the end of the Examination.

ANSWER PROCEDURE

Each question has 4 alternative answers, viz. A, B, C & D. Pick up the most appropriate answer and write the correct number corresponding to the given question.

Example :

31. A man bought a toy for Rs. 112 and sold it for Rs. 164. What fraction of the selling price was his profit ?

- (A) 26/64 (B) 13/35 (C) 13/28 (D) 13/41

The correct answer for the above question is 13/41. Therefore, you are required to mark D in the Answer Sheet against Question No. 31 in the appropriate box.

Question	Answer	Question	Answer	Question	Answer	Question	Answer	Question	Answer
1.		11.		21.		31.	D	41.	

If you decide to change your answer, you must black it out, and write your answer next to it in the same box.



A. Reading Comprehension

Direction: Questions 1 - 10 are based on the following passage. Read the passage below, and then answer the questions that follow the passage. The correct response may be stated outright or merely suggested in the passage.

India has come a long way since the Bengal Famine of 1943. The food situation in India, once characterized by chronic shortages and the spectre of famines, has changed dramatically over the years. From being the biggest recipient of PL 480 aid during the 1950s and 1960s, India today is relatively self-sufficient in food grains at the given level of incomes and prices; in fact, it has marginal surpluses. The General Agreement on Tariffs and Trade (GATT) has been signed, with India as one of the signatories, under which all countries will have to gradually open up their agricultural sectors.

It is, therefore, neither feasible nor desirable to keep India's food grains sector insulated from world markets. In fact, this is an appropriate opportunity for India to integrate its agriculture with global agriculture, and make use of private trade (both domestic and foreign) as an important instrument for efficiently allocating her resources as well as providing food security to her people at the lowest economic cost. The time to change gears in food policy has come.

Food security, in a broader context, means that people have physical and economic access to food. Since food grains have the largest share in the food basket of the poor in a developing country like India, it is the availability of food grains that lies at the heart of the concept of food security. The first step in this direction, therefore, is to make food grains physically available to the people. This can be done by augmenting production, or through imports and transportation of grains to people wherever they are.

There are several ways of achieving these targets. One may rely on private entrepreneurship by letting the individual farmers produce, traders trade/import and make it available to consumers far and wide; or the Government may directly intervene in the production and/or the trade process. In the former case, the Government follows policies that provide appropriate market signals while in the latter, it acts as producer, importer and trader itself. Indian policy makers have followed a mix of both these options. For production, they have relied on the farmers while the Government has retained control over imports. For distribution, it created public agencies to do the job along with private trade, thus creating a dual market structure.

Providing economic access to food is the second part of the concept of food security. This can be best obtained by adopting a cost effective technology in production so that the real price of food grains come down and more people have access to it. In case it still fails to reach the larger sections of the population, the Government can directly subsidize food for the poor, launch a drive to augment their incomes, or try a combination of the two strategies. India has followed both these policies.

1. India has 'come a long way' means
 - (A) may years have passed after the Bengal famine.
 - (B) The food position in India is now vastly improved.
 - (C) India now handles such problems under PL-480 scheme.
 - (D) India has advanced in science and technology.
2. Which of the following views regarding GATT, does the author seem to be advocating?
 - (A) India should seize the chance and make efforts to fulfill its objectives.
 - (B) India should not have signed it, to insulate our food grains sector.
 - (C) India should have agreed to GATT excluding the agricultural sector.
 - (D) India should hand over the issue of food grains security to the private sector.
3. According to the author, why is it necessary to ensure food security to people?
 - (A) In order to sustain economic growth.
 - (B) As per the PL-480 guidelines.
 - (C) In order to be able to export food grains.
 - (D) The passage makes no such assertion.



11. Who is the sprint champion ?
(A) Sarita (B) Veena (C) Ramesh (D) Mohan
12. Who is sitting opposite to the best hurdler ?
(A) Veena (B) Ramesh (C) Sarita (D) Mohan
13. Who is the high jump champion ?
(A) Veena (B) Ramesh (C) Mohan (D) Sarita
14. Which of the following are *not* sitting next to each other ?
(A) Veena and Sarita. (B) Veena and Ramesh
(C) Mohan and Ramesh. (D) Ramesh and sarita.
15. Who is the throwing champion ?
(A) Ramesh (B) Mohan (C) Sarita (D) Veena

Instructions: Answer Q.16, 17, 18 on the basis of the following statements:

Six employees – L,M,N,O,P and R- are being assigned to offices, each of which can accommodate two persons and no more than two. Each person must be assigned to exactly one office and must be assigned to that office either alone or group members to offices, but the following restrictions must be observes:

M cannot share an office with N?
N cannot share an office with O.
P and R must share an office together.

16. Which of the following parts of employees can be assigned to one office together?
(A) L and O (B) L and R (C) N and O (D) M and N
17. If N is assigned to an office alone, which of the following must be true ?
(A) L shares an office with O. (B) M is assigned to an office alone.
(C) The group occupies either 4 or 5 offices. (D) The group occupies either 3 or 6 offices.
18. If P and R are the only ones who share an office, how many offices are the minimum that can accommodate the group ?
(A) 2 (B) 3 (C) 4 (D) 5

Directions: For questions 19-20 consider the following information:

- (i) Five persons: A,B,C,D and E are holding a meeting
- (ii) A converses in Spanish and Italian
- (iii) B converses in Spanish and English
- (iv) C converses in English and Italian
- (v) D converses in French and Spanish
- (vi) E converses in Italian and French

19. Which of the following cannot converse without an interpreter?
(A) B and E (B) A and B (C) A and C (D) B and D

20. If a sixth person is brought in, to be understood by the maximum number of the original five, he should be fluent in
(A) English and French (B) French and Italian (C) Italian and Spanish (D) English and Spanish



C. Logical Reasoning

21. Find the odd one out from the following:
(A) Run (B) Climb (C) Swim (D) Listen
22. If $214=12$, $326=30$, $415=25$, then 523 is
(A) 10 (B) 30 (C) 25 (D) 21
23. Find the number that comes next in the sequence:
5,25,125,7,49,343,9,81,--
(A) 729 (B) 643 (C) 810 (D) 819
24. Pointing to a photograph of a girl, Rajan said, "She has no sisters or daughters but her mother is the only daughter of my mother". How is the girl in the photograph related with Rajan's mother?
(A) Sister-in-law (B) Grand-daughter (C) Daughter-in-law (D) Sister
25. Nageena is taller than Pushpa but not as tall as Manish. Rama is taller than namita but not as tall as Pushpa. Who among them is the tallest?
(A) Manish (B) Pushpa (C) Namita (D) Nageena
26. Drama is related to Director in the same way as Magazine is related to -----?
(A) Reader (B) Printer (C) Editor (D) Story
27. In a certain code, PERFECT is written as RGTHGEV. How will BROWN be written in that code ?
(A) CSPXO (B) DSQYP (C) CTQXP (D) DTQYP
28. In a row of boys, Ram is twelfth from the left and Ramesh is fifteenth from the right. When they interchange their positions, Ramesh becomes twentieth from the right. How many boys are there in the row?
(A) 27 (B) 30 (C) 31 (D) 24
29. The rain is called water, water is called air, air is called cloud, cloud is called sky, sky is called sea, sea is called road, where do the aeroplanes fly?
(A) Water (B) Road (C) Sea (D) Cloud
30. "Kilogram" is related to "Quintal" in the same way as "Paisa" is related to
(A) Coin (B) Money (C) Wealth (D) Rupee

D. Problem Solving Mathematics

31. Value of $\int \frac{dx}{(1+x)\sqrt{1+2x-x^2}}$
- (A) $\frac{1}{2} \sin^{-1}\left(\frac{2x}{1+x}\right) + C$ (B) $\frac{1}{\sqrt{3}} \cos^{-1}\left(\frac{3x}{1+x}\right) + C$
- (C) $\frac{1}{\sqrt{2}} \sin^{-1}\left(\frac{\sqrt{2x}}{1+x}\right) + C$ (D) None of the above



32. A particle moving in a straight line is acted on by a force which works at a constant rate and changes its velocity from 'u' to 'v' in passing over a distance x. What is the time taken by the particle to move distance x.

(A) $\frac{2(u+v)x}{3(u^2+uv+v^2)}$

(B) $\frac{uvx}{u^2-uv+v^2}$

(C) $\frac{3(u+v)x}{2(u^2+uv+v^2)}$

(D) None of the above

33. Solution of $x^2 \frac{d^2y}{dx^2} + 3x \frac{dy}{dx} + 2y = \cos(\log_e x)$ is

(A) $\frac{1}{5}\{C_1 \cos(\log_e x) + C_2 \sin(\log_e x)\} + \frac{1}{x}\{2 \sin(\log_e x) + \cos(\log_e x)\}$

(B) $\frac{1}{x}\{C_1 \cos(\log_e x) + C_2 \sin(\log_e x)\} + \frac{1}{5}\{2 \sin(\log_e x) + \cos(\log_e x)\}$

(C) $\frac{1}{x}\{C_1 \sin(\log_e x) + C_2 \cos(\log_e x)\} + \frac{1}{5}\{\sin(\log_e x) + 2 \cos(\log_e x)\}$

(D) None of the above

34. Value of $\lim_{n \rightarrow \infty} \left\{ \left(1 + \frac{1}{n}\right) \left(1 + \frac{2}{n}\right) \dots \left(1 + \frac{n}{n}\right) \right\}^{\frac{1}{n}}$

(A) $\frac{4}{e}$

(B) $\frac{1}{\sqrt{3e}}$

(C) $\frac{3}{e}$

(D) $\frac{1}{\sqrt{e}}$

35. One of the real roots of the equation $x^4 + 5x^3 + x^2 - 13x + 6 = 0$ is

(A) 2

(B) 3

(C) $\frac{1}{\sqrt{2}}(-3 + \sqrt{17})$

(D) $\frac{1}{2}(-3 + \sqrt{17})$

36. Find the number of permutations when six(6) letters at a time are taken from the word RAMAYANAM.

(A) 3115

(B) 2015

(C) 2115

(D) 2110

37. How many integer numbers between 1 and 250 that are divisible by 2, 3, 5 and 7.

(A) 123

(B) 194

(C) 153

(D) 193

38. A lot contains 12 items of which four(4) are defective. Three(3) items are drawn at random from the lot one after the other. What is the chance that all three are non defective?

(A) 50%

(B) 25.45%

(C) 12.5%

(D) 26.5%



39. One of the solutions of these following simultaneous equations is

$$\begin{aligned}10x_1 + x_2 + x_3 + x_4 &= 13.5 \\x_1 + 10x_2 + x_3 + x_4 &= 24.3 \\x_1 + x_2 + 10x_3 + x_4 &= -20.7 \\x_1 + x_2 + x_3 + 10x_4 &= -25.2\end{aligned}$$

(A) -2 (B) 2 (C) -2.2 (D) None of the above

40. A stone is dropped from a certain height and is observed to fall the last h cm in t second. What is the total time of fall?

(A) $h + \frac{1}{2}gt$ (B) $\frac{t}{2} + \frac{h}{gt}$

(C) $\frac{t^2 + h^2}{2gt}$ (D) None of the above

E. Problem solving Physics

41. Two railway-lines cross at right angles. One train running at a speed of 48 km/h along one line crosses the junction at 7 pm. Another train moving at a speed of 64 km/h along the other line crosses the junction at midnight (12 pm). The time when they were nearest to each other is

(A) 30 minutes past 10 pm (B) 11 pm
(C) 9 pm (D) 12 minutes past 10 pm

42. A car 2m wide is moving with a uniform speed of $\sqrt{37}$ m/s along the edge of a road. When the car is 12 m away from a man, the man starts to cross with a uniform velocity \bar{u} directed such that he can cross the road just safely. The speed of the man is

(A) 2 m/s (B) 1 m/s (C) 1.5 m/s (D) 3.5 m/s

43. A gun kept on a straight horizontal road is used to hit a car travelling along the same road away from the gun with a uniform speed of 72 km/h. The car was at a distance of 500 m from the gun when the gun is fired at an angle of 45° with the horizon. The distance of the car from the gun when the shell hits it is ($g = 10 \text{ m/s}^2$).

(A) 743m (nearly) (B) 800m (nearly) (C) 600m (nearly) (D) 900m (nearly)

44. Three bodies, one a circular disc: the other, a cylinder and the third, a sphere of same mass and radius are allowed to roll down an incline from the same height. Which of them will reach the ground earlier?

(A) the cylinder (B) the circular disc
(C) the sphere (D) all the three at the same time

45. A block of ice (density 0.9gm/cc) with an area of 1 m^2 and height 0.4 m floats in water. What amount of work is to be done to submerge the block completely into water?

(A) 6.5 J (B) 7.8 J (C) 9.2 J (D) 15.6 J



46. A particle of mass m is projected vertically from the surface of earth with a velocity V . What is the maximum height attained by the particle ($v_e =$ escape velocity, $R =$ radius of earth)

(A) $\frac{V^2 R}{(v_e^2 - V^2)}$ (B) $\frac{VR}{(v_e - V)}$

(C) $\frac{V^2}{2g}$ (D) $\frac{V^2 R}{V_e^2}$

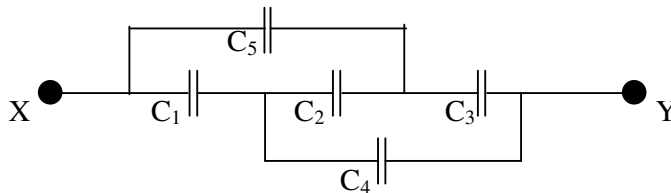
47. Assume that the thermal conductivity of copper is 4 times that of brass. Two rods of copper and brass having the same length and cross-section are joined end to end. The free end of the copper rod is kept at 0°C and the free end the brass rod is kept at 100°C . The temperature of the junction in the steady state is

(A) 40°C (B) 20°C (C) 30°C (D) 45°C

48. Two plane mirrors AB and BC are joined at B and placed back to back. On opening out it is found that all parallel rays incident on them after reflection make an angle of 120° . The angle between the mirrors is

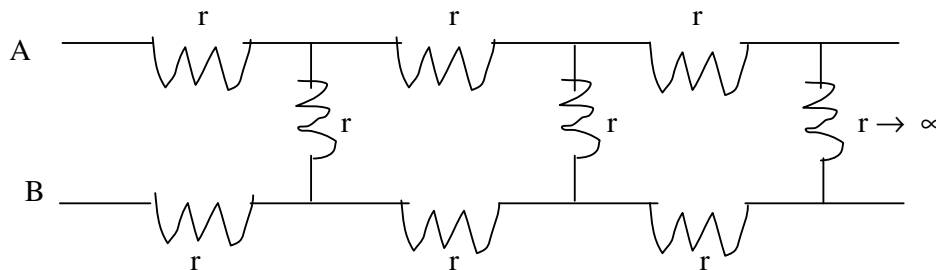
(A) 12° (B) 30° (C) 20° (D) 60°

49. The equivalent capacitance between X and Y of the arrangement shown in the diagram where $C_1 = C_3 = C_4 = C_5 = 4\ \mu\text{f}$ and $C_2 = 10\ \mu\text{f}$ is



(A) $7\ \mu\text{f}$ (B) $6\ \mu\text{f}$ (C) $4\ \mu\text{f}$ (D) $5\ \mu\text{f}$

50. The resistance of the infinite network shown in the figure is



(A) $R = r(1 + \sqrt{3})$ (B) $R = r(1 + \sqrt{5})$ (C) $R = r(1 + \sqrt{2})$ (D) $R = r(1 + \sqrt{7})$